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cultivated." This method of garden culture is stimulated by societies which furnish lectures to the masses, publications in the shape of primers, etc. This portion of Mr. Dean's work will be particularly appreciated by those who are interested in a similar work for the city poor in this country.

The work before us is interesting in its classification of the products, or rather the crops of the garden. The first group is the tap and bulbous-rooted vegetables, including beets, carrots, onions, celeriac, turnip, etc., followed by tuberous-rooted vegetables, of which the potato is the leading example. Under pod-bearing vegetables are peas and beans, and the fruit-bearing vegetables include squashes, cucumbers, tomatoes. Cabbage and spinach are under green vegetables, while of edible stemmed plants, as asparagus, rhubarb and celery and representatives, and also the mushroom.

The handbook is quite English in the varieties it recommends, and the calendar for operations does not coincide with the one for our climate and seasons.

BYRON D. HALSTED.

#### SCIENTIFIC NOTES AND NEWS.

##### THE METRIC SYSTEM.

*Appleton's Popular Science Monthly* for June reprints the letters contributed anonymously by Mr. Herbert Spencer to the *London Times*, and endorses their point of view in an editorial article. The *Monthly* cannot but be admired for its allegiance to Mr. Spencer even in his vagaries, but it must be regarded as unfortunate that a journal whose readers will expect to find it represent the consensus of opinion of men of science should advocate the prejudices of the uninformed. We are not surprised to find that part of Mr. Spencer's contribution was written fifty years ago, and that the authorities he quotes are Sir John Herschel's article of 1863 and Prof. H. A. Hazen. But it was not to be expected that Mr. Spencer would confuse the metric and a decimal system, and argue that the former should not be adopted because the calendar cannot conveniently be divided deci-

mally. Can the week be divided into quarters, eights and thirds, which Mr. Spencer rightly regards as desirable? If our ancestors had had twelve fingers in place of ten we should now have a better system of numeration, but the ideal and distant day, when we shall all do what is most reasonable, can be brought nearer by acting reasonably in the present and adopting the admirable system so rapidly becoming universal. For as Sir John Herschel wrote in 1863, "Were the question an open one what standard a new nation, unprovided with one and unfettered by usages of any sort should select, there could be no hesitation."

##### THE RÖNTGEN RAYS.

*Nature* gives an account of early experiments on the Röntgen rays by Prof. A. Battelli and Dr. A. Garbasso, of Pisa. Referring to the discovery that the time of exposure required for taking photographs with these rays can be greatly shortened by placing certain fluorescent substances behind the photographic plate, the authors point out that they described a method of doing this in the January number of *Il Nuovo Cimento*. In some cases Prof. Battelli and Dr. Garbasso obtained good photographs with an exposure of only two seconds. In their paper experiments were also described proving that Röntgen rays can be reflected (or at any rate scattered) from surfaces, but indicating an absence of refraction. Since the appearance of the above paper Prof. Battelli has communicated two further papers to the same journal. In the first the author arrives at the conclusion that Röntgen rays behave as if they emanate from the base of the vacuum tube rather than from the anode or cathode, also that they are emitted even after the discharge in the tube has ceased (as proved by the discharge of an electrified disc in the neighborhood of the tube). In the second paper Prof. Battelli deduces that the rays which emanate from the cathode in a vacuum tube possess photographic properties; that their action increases as the rarefaction increases (at least up to  $\frac{1}{200}$  mm. of pressure); and that some of the rays are deflected by a magnet, while others are not. It is hence quite permissible to maintain that Röntgen rays exist in the interior of the tube.

## THE STORAGE OF WATER.

IN a lecture delivered before the Royal institution and printed in *Science Progress*, Prof. E. Frankland states that storage has an excellent effect upon the chemical and especially upon the bacterial quality of water. Thus the storage of Thames water by the Chelsea Company for only thirteen days reduces the number of microbes to one-fifth the original amount, and the storage of the river Lea water for fifteen days, by the East London Company, reduces the number on the average from 9,240 to 1,860 per cubic centimetre or to one-fifth; and lastly, the water of the New River Cut, containing on the average 4,270 microbes per cubic centimetre contains, after storage for less than five days, only 1,810, the reduction here being not so great, partly on account of the shorter storage, but chiefly because the New River Cut above the point at which the samples were taken is itself a storage reservoir containing many days' supply after filtration. Indeed, quietness in a subsidence reservoir is, very curiously, far more fatal to bacterial life than the most violent agitation in contact with atmospheric air; for the microbes which are sent into the river above the falls of Niagara, by the City of Buffalo, seem to take little or no harm from that tremendous leap and turmoil of waters, whilst they subsequently, very soon, almost entirely disappear in Lake Ontario.

Prof. Franklin holds that if the water of the Thames basin were properly collected and stored it would furnish London with an ample supply of excellent water for fifty years to come.

## CRATER LAKE.

THE U. S. Geological Survey has issued a special map showing Crater Lake, Oregon. In the accompanying description Mr. J. S. Diller states that the lake is approximately circular and averages a little over 5 miles in diameter. It is reputed to be the deepest fresh water in America, having the remarkable depth of 2,000 feet. The steep slopes of the escarpment rise from 500 to 2,200 feet above the water, forming a remarkable pit. The average diameter at the top of the pit is 5.7 miles, and its depth is 4,000 feet. Nearly one third of its

bottom is over one hundred feet below the level of Klamath marsh, at the eastern foot of the Cascade Range.

"The problem at once arises, How was this vast mountain, nearly six miles in diameter and possibly 5,000 feet or more in height above the present rim of the lake, removed, and the stupendous pit now occupied by Crater Lake produced? Did it go up or down? If it was blown out by an explosion we should find an enormous rim of fragmental material commensurate with the basin; but if it sank by escape of its molten interior through a lower outlet the rim would be small and composed of imbricated and overlapping sheets of lava and fragmental material. In fact, the rim is small and composed in large measure of solid lava sheets. It is evidently the peripheral part of the original mountain's base, and not due to accumulation at the time the basin originated. Maj. C. E. Dutton, who made a special survey of Crater Lake, compares it to Kilauea, of Hawaii, whose origin he attributes to subsidence of the material in a molten state owing to its escape at some lower level. The pumice upon the surface for many miles around Crater Lake was probably blown out at Crater Lake before the pit developed, and the volcano of Wizard Island was active at a much later stage upon the bottom of the pit. It was the scene of the last eruption about the lake, and, although recent in appearance, must have occurred centuries ago."

## GENERAL.

THE New York Academy of Sciences has appointed a committee consisting of Prof. William Stratford, Mr. C. F. Cox, Prof. E. B. Wilson and Prof. G. S. Huntington, to solicit subscriptions on behalf of the Huxley Memorial Fund. As has been already stated in this JOURNAL, the fund will be used to erect in South Kensington Museum a memorial statue similar to those of Darwin and Owen, and secondly, if a sufficient amount of money be raised, to establish scholarships or a fund for original research. Contributions should be sent to Mr. Cox, Grand Central Station, New York.

DURING the Buffalo meeting of the A. A. A. S., Section H, anthropology will observe, as far as practicable, the following order of program:

Monday, address of the Vice-President, Miss Alice C. Fletcher; Tuesday, archæology; Wednesday, ethnology; Thursday, somatology and psychology; Friday, general anthropology.

AN International Congress of Hydrology, Climatology and Geology, will be held at Clermont-Ferrand, France, from September 28th to October 6th. The Minister of the Interior of the Republic has accepted the honorary presidency, and the government of the United States has been invited to appoint delegates.

DR. J. WALTER FEWKES will again conduct explorations for the Smithsonian Institution among the Pueblos of Arizona. He left Washington for a three months' expedition, on Saturday, May 30th, accompanied by Dr. Walter Hough, of the National Museum.

THE section of agriculture of the Paris Academy has nominated the following candidates, one of whom will be selected to fill the vacancy caused by the death of M. Reiset. In the *first class*, Mr. Müntz; *second*, M. Risler; *third*, MM. Laboulbène, Maquenne and Th. Schloesing, fils.

THE first number of *Kantstudien*, a new 'Archiv.', edited by Prof. Hans Vaihinger of Halle, and published by Leopold Voss, Hamburg and Leipzig, was issued on April 25th. A special magazine devoted to Kant bears witness to the vitality of the critical philosophy in Germany, but will perhaps lead men of science to reflect that it is fortunate that they do not need to go back one hundred years and begin over again, as required by the philosophical program. The first number of the *Kantstudien* extends to 160 pages, and contains, in addition to an introduction by the editor, articles by Profs. Adickes, Vorländer, Stadler and Pinloche (the last in French), reviews and 'Kantiana.'

PROF. RÖNTGEN has been made a corresponding member of the Berlin Academy of Science.

WE learn from the *Naturwissenschaftliche Rundschau* that the mathematician, Prof. Ernest Padova died at Pisa on March 9th, and that Prof. Liebscher, director of the Agricultural Institute of Göttingen, died on May 9th.

THE New York *Medical Record* states that Prof. Ehrlich has been appointed director of the

new State institute in Berlin for the testing of therapeutic serum and of the laboratory attached thereto.

THE Senate Committee has unanimously reported in favor of the bill restricting vivisection in the District of Columbia. The bill provides, first, for the use of anæsthetics in all painful experiments on living vertebrate animals, inoculation experiments, tests of drugs and medicines and cases of recovery from surgical procedure being exempted from this requirement; second, for the licensing of all experimenters by the District Commissioners, except those who are duly authorized officers of the government of the United States or of that of the District of Columbia; third, for the prohibition of vivisection in the public schools and in exhibitions for the general public; fourth, for the inspection of all places of experiment by inspectors to be appointed by the President of the United States. It has not been shown that any case of cruelty to animals by men of science has ever occurred in the District of Columbia, and the proposed legislation seems entirely useless.

WE learn from *Nature* that the Swedish Tourists' Club has organized an expedition to the Great Lake Falls next August. The object of the expedition is to give those who join it an opportunity of seeing the total eclipse of the sun on August 9th, on becoming acquainted with Lapland, and at the same time to see two of the waterfalls in Europe—the Great Lake Falls (Stora Sjöfallet) and Harsprånget. The party will start from Gellivare on August 3d. Further information with reference to the journey can be obtained at the Tourists' Club, No. 28 Fredsgaten, Stockholm.

ACCORDING to the New York *Medical Record* the Wistar Institute of the University of Pennsylvania will receive, through the generosity of Gen. Isaac J. Wistar, a number of new buildings. The Institute was founded in 1892 for the preservation of the Wistar and Horner collections and for the promotion of study and advanced research in anatomy and biology. The most important of the new buildings will adjoin the present one, and will be used chiefly for the accommodation of the large number of specimens that have been contributed to the

Wistar and Horner collections during the past three or four years. A second building is designed to furnish heat and light to the Institute. When the Institute was established General Wistar endowed it sufficiently to provide for beginning the advanced and original work for which it was intended. Every facility will now be provided for the work of original investigators under the supervision of a competent director and skilled assistants. The grading of the ground previous to the erection of the new buildings has already been begun, and it is expected that the work will be completed by the beginning of the fall term.

THE managers of the Department of Natural Science Instruction in the National Educational Association are putting forth strenuous efforts to make the first meeting of the new department a most successful one. Many scientific men have already signified their intention to be present to take part in the meetings. The scientific men of Buffalo have taken hold of the matter, also, and are now proposing to organize a New York State Association of Natural Science Teachers. The movement for better science teaching thus promises to spread rapidly, and it appears that there will now be afforded such an opportunity for the effective urging of better methods and better aims as has never before occurred. This movement should be of especial interest to college and university men, since it will deal largely at first with secondary instruction, or, in other words, with *preparation* for college, and it is hoped that many college men will be in attendance. The local Science Committee in Buffalo has designated the Genesee Hotel as headquarters. This is now the Y. M. C. A. Building, where so many of the meetings will be held. The officers of the department will be in attendance at headquarters early in the week to confer with teachers and all interested in science as a factor in education.

THE United States Civil Service Commission will hold an examination on June 9th to fill two vacancies in the position of Assistant Geologist in the United States Geological Survey. The competitors must possess certain linguistic accomplishments, but the examination will relate

in the main to general geology and petrography, and one of the two appointed will be required to have a special training in economic geology. All competitors must show that they have had practical experience in the field under an expert geologist. The examination will be held in Washington and in other large cities where there are applicants. The number of competitors will be large. Persons desiring to compete should write to the United States Civil Service Commission, Washington, D. C. This is the first Civil Service Examination for the geologic force since the Survey was placed in the classified service, which covers all the scientific and technical places. Vacancies in other branches of the work have long been filled in this way.

It has been reported to the State Department by the United States Consul at Aden that Prof. Daniel C. Elliot, of the Field Columbian Museum of Chicago, with Mr. C. H. Akeley and Mr. Dodson, who accompanied Dr. Donaldson Smith on his recent expedition to Lake Rudolph, in Central Africa, arrived at Aden, at the mouth of the Red Sea, on April 14th, and after a stay at that point of a week, securing men, camels and stores, proceeded on their scientific exploration into Central Africa, the main purpose of which is to collect specimens of the animals which are rapidly disappearing.

THE death is announced of Dr. Carleton Pennington Frost, Dean of Dartmouth Medical College and professor of medicine, who died on May 24th at the age of sixty-six; also of Mr. Thomas Maine, a mechanical engineer and the author of a work on the history of the steam engine.

THE Philadelphia *Bulletin* announces that work will probably soon begin on the Museum of Art and Science of the University of Pennsylvania, for which the city has turned over to the institution twelve acres of ground adjoining the site of the Philadelphia Museum. Plans have been completed for the building, which will be an imposing structure, costing upwards of \$1,000,000. A portion of the appropriation from the State in 1895 was for the purpose of erecting the museum building. This appropriation, together with the private subscriptions,

has raised the building fund to over \$300,000, and it is probable that work will be begun on one wing of the structure this summer.

At the recent *Conversazione* of the Royal Society, according to the report in the *London Times*, Prof. Roberts-Austen showed several curious experiments, which are modifications of one recently described by Margot, of Geneva. A fine wire of aluminium is heated to no less than 400 degrees above its melting point, but the wire, nevertheless, remains intact. This is owing to the formation of a fine film of alumina on the surface of the wire, and the metal, being very light, does not run into globules, as it might be expected to do. The molten wire has, moreover, a current passing through it and will, if approached by a similar wire or by a magnet, enable all the effects of mobile conductors carrying currents to be illustrated. One experiment showed that the molten wire can even be twisted on itself without rupture, and the effects of a tenacious thread of molten metal moving in response to electrical influences are very singular.

M. MÉLINE, who is Minister of Agriculture as well as Premier of France, has directed the professors of agriculture to suspend their lectures and to go through the rural districts in order to advise farmers to meet the failure of the hay crop by sowing vetches, maize and other fodder, as also by utilizing oilcake, straw, bran and corn.

At a recent meeting of the British Astronomical Association, Dr. Gill, astronomer in charge of the Royal Observatory at the Cape of Good Hope, according to the report in the *London Times*, gave an account of the work in which he had been engaged. He mentioned first the completion of his investigation on the solar parallax and the mass of the moon, derived from observation of minor planets on a programme which he had prepared and which had been carried out at Newhaven, Leipsig, Göttingen and Bamberg, as well as at the Cape. The details of these results would be presented to the Congress of Directors of Nautical Ephemerides, which would assemble in Paris in May, and he would urge at that meeting the adoption of these constants for general use by astrono-

mers. Dr. Gill also stated that the work of the geodetic survey of South Africa, which he had directed since 1885, was completed and printed, and that the report would be presented to the Cape Parliament in May. The first volume of the Cape *Durchmusterung* had been passed through the press. The whole of the latter work would consist of three volumes containing the places and magnitudes of 450,000 stars between latitude 18 deg. south and South Pole; it would be complete as far as magnitude 9.3 or 9.4, and would contain most of the stars as far as the 10th magnitude. A fundamental star catalogue for the equinox, 1890, containing the results of the Cape transit circle observations during the past ten years, was far advanced towards completion. Dr. Gill also mentioned that Mr. M'Clean's splendid gift of a powerful equatorial would now divert his efforts more to the field of astrophysics.

THE *Washington Star* states that a large invoice of plants for the department of botany has just been received at the Catholic University from Rev. Father Langlois, of Louisiana. This is the third donation of the kind Father Langlois has made to the University this year. Dr. Greene will leave for California shortly to collect specimens for his herbarium.

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#### UNIVERSITY AND EDUCATIONAL NEWS.

THE United States Senate has passed the bill to charter the National University.

THE trustees of the College of New Jersey at Princeton, commonly called Princeton College, have filed in the County Clerk's office a certificate changing the name of the institution to Princeton University.

At a meeting of about fifty friends of the Johns Hopkins University in Baltimore, on May 26th, the sum of \$138,750 was subscribed toward meeting the deficit caused by the failure of the Baltimore & Ohio Railroad to pay dividends on its stock. It is hoped that \$50,000 a year for five years may be subscribed.

MT. HOLYOKE COLLEGE has received \$7,000 by the will of Miss Hitchcock, of Springfield.

THE twenty-fifth anniversary of President Angell's administration will be celebrated at the